

## **AUTOMATIC ANTI-ACCIDENT ELECTRICAL OUTLET**

### **Field of the invention**

The present invention relates to an automatic anti-accident electrical outlet and, more particularly, to an electrical outlet capable of automatically cutting off the power source to avoid sparking of electric wires and maintain safety in the use of electric appliances when the electric current thereon is overloaded.

### **Background of the invention**

Nowadays, various kinds of electric appliances have been invented, and bring much convenience and enjoyment to people. Electricity is required for the operation of electric appliances. However, hazards may occur due to breakdown of electric appliances, overload in use, damage of internal components or sparking of electric wires, among which sparking of electric wires is the most dangerous and causes the greatest harm.

Generally, sparking of electric wires results from improper use of electric appliances, common use of the same electrical outlet by several electric appliances, or breakdown of electric appliances. These problems cause an overload of the electric current in the electrical outlet and thus the hazard of sparking of electric wires. The results are catastrophic. Sparking of electric wires can damage the whole circuit system, and may endanger neighbors. In fact, many fires are caused by sparking of electric wires.

Usually, the electrical outlets on the wall of homes, public places and business offices are insufficient. Many people install an extension cord or a multi-electrical outlet in an electrical outlet for use of more electric appliances. Therefore, the electrical outlet bears a large load. When the load exceeds a certain value and the electrical outlet can bear no more, a short circuit or even

sparking of electric wires occurs. R.O.C. Pat. No. 413,404 proposes an improved electrical outlet in which an overload protection circuit and a counter are used to cut off the power source when the electric current is overloaded. However, after the overload situation has been obviated, the normal function of 5 power supply cannot be restored, hence causing inconvenience in practical application.

### **Summary of the invention**

The primary object of the present invention is to provide an automatic anti-accident electrical outlet, which integrates a main body, a circuit board and 10 an overload protector into an electrical outlet. The circuit board is used for installation of the overload protector and connection between the overload protector and the main body. The circuit board has insertion rods for insertion into insertion holes of the main body. Through holes of the circuit board exactly coincide with electric wire insertion holes of the main body so that 15 power can be output through the overload protector by the main body. When the electric current of the electrical outlet is overloaded, the overload protector on the circuit board automatically cut off the electricity to the electrical outlet. Moreover, an alarm lamp on the circuit board is illuminated to warn the user of the problem.

20 Another object of the present invention is to provide an automatic anti-accident electrical outlet, by which a function restoration button on the overload protector can be pressed to restore power to the electrical outlet after the abnormal situation has been resolved.

Yet another object of the present invention is to provide an automatic 25 anti-accident electrical outlet, in which the circuit board can be directly

installed on the main body of an existent electrical outlet to accomplish the effect of convenient and easy installation without needing to change the type of electrical outlet, damaging the structure of the main body, or replacing existent electrical outlets.

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#### **Brief description of the drawings:**

The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing, in which:

- Fig. 1 is a perspective view of the present invention;
- 10 Fig. 2 is an exploded perspective view of the present invention;
- Fig. 3 is a circuit diagram of the circuit board of the present invention;
- Fig. 4 is another circuit diagram of the circuit board of the present invention;
- and
- Fig. 5 is a diagram showing the connection between the circuit board and power source wires of the present invention.

#### **Detailed description of the preferred embodiments**

As shown in Figs. 1 and 2, an electrical outlet 10 of the present invention comprises a main body 20, a circuit board 30, an alarm lamp 40 and an overload protector 50. Several insertion holes 21 and electric wire insertion holes 22 are provided on the back face of the main body 20. The circuit board 30 is used for connection between the overload protector 50 and the main body 20. A surge capacitor 31, a step-down resistor 32, a rectifying diode 33 and the alarm lamp 40 are installed on the circuit board 30. The overload protector 50 is installed on the circuit board 30 and connected with the components on the circuit board 30. A function restoration button 51 protruding from the main

body 20 is also provided on the overload protector 50. Several insertion rods 34 and through holes 35 are provided on the circuit board 30.

The insertion rods 34 on the circuit board 30 are inserted into the insertion holes 21 of the main body 20. The through holes 35 of the circuit board 30 5 exactly coincide with the electric wire insertion holes 22 of the main body 20 to form a circuit between the circuit board and the main body. As shown in Figs. 3, 4 and 5, one of power source wires 60 passes through one of the through holes 35 of the circuit board 30 and is inserted into one of the electric wire insertion holes 22 of the main body 20. The other power source wire 60 is inserted into a 10 power source insertion hole 36 of the circuit board 30 to electrify the main body 20 and the circuit board 30. Power is output through the overload protector 50 by the main body 20 for operation of an electric appliance. When the load on the main body 20 is normal, each component on the circuit board 30 operates normally. Once the electric current of the whole electrical outlet 10 15 is overloaded, the overload protector 50 on the circuit board 30 automatically cuts off the electricity so that electrical outlet 10 is off. Simultaneously, the alarm lamp 40 on the circuit board 30 is illuminated to alert the user to the abnormal situation. After the user has resolved the problem, the function restoration button on the overload protector 50 is pressed to restore power to 20 electrical outlet 10, and the alarm lamp 40 on the circuit board 30 simultaneously turns off.

To sum up, the present invention connects the overload protector and the electrical outlet circuit together. When the electric current used by electric appliances plugged into the electrical outlet is overloaded, the overload 25 protector on the circuit board automatically cuts off the electricity to avoid

occurrence of hazards. After the abnormal situation has been resolved, the function restoration button on the overload protector is pressed to let the electrical outlet provide power again.

Although the present invention has been described with reference to the 5 preferred embodiment thereof, it will be understood that the invention is not limited to the details thereof. Various substitutions and modifications have been suggested in the foregoing description, and others will occur to those of ordinary skill in the art. Therefore, all such substitutions and modifications are intended to be embraced within the scope of the invention as defined in the appended 10 claims.